

Applicant: Teppo Kojo
PCT App. No.: PCT/FI2004/000247
Preliminary Amendment filed Oct. 21, 2005

Claim Listing

1-9. (cancelled)

10. (new) A method for calculating/optimizing the diameter of a paper or board web machine reel, in which a web is wound in a paper or board machine into machine reels on a reel-up, which are run on a slitter-winder to form customer rolls, whose desired diameter and width are determined according to customer need, and in which a continuous-trimming running mode is used in which a desired amount of web is run into a machine reel and, when needed, splicing is performed on the slitter-winder to produce customer rolls with a desired diameter size, the method comprising the steps of:

determining the diameter of the machine reel to be wound on the paper or board machine on the basis of restrictions set by the customer on the location of a splice in the customer roll and the amount of broke being produced from the machine reel is optimized, that, in the method, information about the customer rolls to be slit is obtained from a production control system for calculating/optimizing a machine reel diameter instruction for the purpose of optimizing the diameter of the next machine reel, and that the calculated/optimized machine reel diameter instruction is set in a control system of the reel-up; and

forming a machine reel on the paper or board machine according to the machine reel diameter instruction.

11. (new) The method of claim 10 wherein the calculated/optimized machine reel diameter instruction is fed manually to the control system of the reel-up.

12. (new) The method of claim 10 wherein the calculated/optimized machine reel diameter instruction is transmitted automatically to the control system of the reel-up.

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13. (new) The method of claim 10 wherein the restrictions on the splice location are set according to each individual paper grade, printing house and/or order.

14. (new) The method of claim 10 wherein the number and the location of the splices to be placed in customer rolls and the resultant machine reel broke, caused because of the joining of machine reels to one another, are optimized.

15. (new) The method of claim 10, wherein undersize machine reels produced as a result of web breaks on the paper or board machine and the optimization of the location of the splice used for joining them are taken into account in the method.

16. (new) The method of claim 10 wherein the slitting order of machine reels is changed by means of the method.

17. (new) The method of claim 10, wherein the method is applied as a stand-alone system in connection with a slitter-winder and a machine reel-up.

18. (new) The method of claim 10, wherein the method is applied as a part of a production control system of the paper or board machine.

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19. (new) A method of forming customer rolls on a slitter-winder from machine reels formed on a paper or board machine having a reel-up, the method comprising the steps of:

winding a first machine reel of a paper or board web on the paper or board machine reel-up, the first machine reel being formed to have a first diameter;
winding a second machine reel of a paper or board web on the paper or board machine reel-up, the second machine reel being formed to have a second diameter; and
running the first machine reel and the second machine reel on the slitter winder, and splicing the webs of the two machine reels together on the slitter winder, the spliced-together webs being run into a plurality of customer rolls, wherein the customer rolls are formed to have a desired diameter and width which are determined according to a customer's need, and wherein one of the first and second reel is wound to a machine reel diameter instruction, said machine reel diameter instruction being determined on the basis of restrictions set on the location of a splice in the customer roll, wherein information about the customer rolls to be slit is obtained from a production control system for determining the machine reel diameter instruction, and the machine reel diameter instruction is set in a control system of the reel-up.

20. (new) The method of claim 19 further comprising the step of manually feeding the determined machine reel diameter instruction to the control system of the reel-up.

21. (new) The method of claim 19 wherein the determined machine reel diameter instruction is transmitted automatically to the control system of the reel-up.

22. (new) The method of claim 19 wherein the restrictions on the splice location are set according to each individual paper grade, printing house and/or order.

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23. (new) The method of claim 19, wherein one of the first machine reel and the second machine reel is an undersize machine reel produced as a result of a web break on the paper or board machine.

24. (new) The method of claim 19 further comprising the step of changing the order of the first and second machine reels being run on the slitter winder.

25. (new) The method of claim 19, wherein the method is applied as a stand-alone system in connection with a slitter-winder and a machine reel-up.

26. (new) The method of claim 19, wherein the method is applied as a part of a production control system of the paper or board machine.

27. (new) The method of claim 19 wherein a machine reel to be wound has a machine reel surface area defined as $\pi * (\text{the radius of the machine reel squared} - \text{the radius of a reeling drum on which the machine reel is formed, squared})$, and a first customer roll to be formed has a surface area defined as $\pi * (\text{the radius of the first customer roll squared})$, and the specific number of first customer rolls to be formed is defined as X, and the last customer roll surface area falls within an allowable range as set by the restrictions on the splice location in the customer roll, and the step of determining a machine reel diameter instruction comprises the step of calculating machine reel surface area - [last customer roll surface area + X * first customer roll surface area], and checking whether a splice location will be acceptable based on said calculation.

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28. (new) The method of claim 19 wherein the step of determining a machine reel diameter instruction takes into account an order list including desired customer roll diameter, core diameter, number of sets to be run, restrictions on machine reel dimensions, and further comprises:

calculating the surface area and diameter of a bottom set; and
checking that the splice formed by joining a machine reel of a diameter determined by the machine reel diameter instruction and another machine reel, based upon set splice location restrictions, will not be too close to the bottom or the surface of the customer roll; and wherein if the splice location is acceptable the machine reel diameter instruction does not change; and wherein if the splice location is too close to the bottom the machine reel diameter instruction is reduced such that the splice location is acceptable; and wherein if the splice location is too close to the surface the machine reel diameter instruction is increased such that the splice location is acceptable.